The SEL-2245-2 provides dc analog inputs for the SEL Axion®. Within an Axion system, install as many as sixteen SEL-2245-2 modules in any combination you want.

Front Panel

![Figure 1 SEL-2245-2 DC Analog Input Module](image)

Mechanical Installation

Each SEL-2242 chassis/backplane has four or ten slots, labeled A–J. Slots B–J support the SEL-2245-2 modules.

![Figure 2 Notch for Module Alignment](image)

To install an SEL-2245-2 module, tip the top of the module away from the chassis, align the notch on the bottom of the module (shown in Figure 2) with the slot you want on the chassis, and place the module on the bottom lip of the chassis as Figure 3 illustrates. The module is aligned properly when it rests entirely on the lip of the chassis.
Next, carefully rotate the module into the chassis, making sure that the alignment tab fits into the corresponding slot at the top of the chassis (refer to Figure 4). Finally, press the module firmly into the chassis and tighten the chassis retaining screw.

**Input Connections**

The SEL-2245-2 dc analog inputs include a plus sign to indicate the positive convention. Refer to Specifications for analog input ratings and to Figure 1 for terminal assignments. You can configure inputs to measure ±20 mA, ±2 mA, or ±10 V signals. Configure inputs by adding a Fieldbus I/O connection for each module in ACCELERATOR RTAC® SEL-5033 Software. See the EtherCAT® portion in Section 2: Communications in the SEL-5033 software manual for details.

**LED Indicators**

The LEDs labeled **ENABLED** and **ALARM** are related to EtherCAT network operation. The green **ENABLED** LED illuminates when the module is operating normally on the network. The **ALARM** LED illuminates during network initialization or when there is a problem with the network. Refer to Section 3: Testing and Troubleshooting in the SEL-2240 Instruction Manual for more information.
Specifications

Compliance

Designed and manufactured under an ISO 9001 certified quality management system
UL Listed to U.S. and Canadian safety standards (File NRAQ, NRAQ7 per UL508, and C22.2 No. 14)
CE Mark

General

Operating Temperature Range:
-40° to +85°C (–40° to +185°F)
Note: Not applicable to UL applications.

Operating Environment

Pollution Degree: 2
Overscoltage Category: II
Insulation Class: 1
Relative Humidity: 5–95%, noncondensing
Maximum Altitude: 2000 m

DC Transducer (Analog) Inputs (SEL-2245-2)

Input Impedance

Current Mode: 200 Ω for ±20 mA
5000 Ω for ±2 mA
Voltage Mode: 10 MΩ

Input Range (Maximum):

±20 mA (transducers: 4–20 mA or 0–20 mA typical)
±2 mA (transducers: 0–1 mA or 0–2 mA typical)
±10 V (transducers: 0–5 V or 0–10 V typical)

Sampling Rate:
1 ksps

Anti-Alias Filter

Corner Frequency: 330 Hz
Rolloff: 20 dBV per decade

Digital Filter

Corner Frequency: Filter A: 16 Hz
Filter B: 10 Hz
Filter C: 0.2 Hz

50 Hz Rejection: Filter A: > 30 dB
Filter B: > 50 dB
Filter C: > 70 dB

60 Hz Rejection: Filter A: > 60 dB
Filter B: > 70 dB
Filter C: > 70 dB

Step Response

No Filter: 3 ms (10–90% response)
Filter A: 23 ms (10–90% response)
Filter B: 35 ms (10–90% response)
Filter C: 700 ms (10–90% response)

Isolation:

500 Vac between separate inputs
2000 Vac all inputs to chassis

Accuracy at 25°C

ADC: 16 bit

Inputs:
0.25% of full-scale typical (voltage mode)
0.05% with field calibration (voltage mode)
0.5% of full-scale typical (current mode)
0.1% with field calibration (current mode)

Accuracy Variation With Temperature

Inputs: ±0.015% per °C of full scale
(±20 mA, ±2 mA, or ±10 V)
ADC: ±0.004% per °C

Triggered Waveform Recording

Sampling Rate: 1 kHz
Record Duration: 0.1 second increments from 0.5 s to 144 s
Record Pretrigger: 0.0 s minimum to a maximum of (record length minus 0.05) s


Type Tests

Environmental Tests

IP3X excluding the terminal blocks

Vibration Endurance, Severity: Class 1
Vibration Response, Severity: Class 1

Bump Test, Severity: Class 1
Shock Withstand, Severity: Class 1
Shock Response, Severity: Class 1

Seismic: IEC 60255-21-3:1993
Quake Response, Severity: Class 2

Cold: IEC 60068-2-1:2007
–40°C, 16 hours

+85°C, 16 hours

Damp Heat, Cyclic: IEC 60068-2-30:2005
25°C to 55°C, 6 cycles, 95% relative humidity

Dielectric Strength and Impulse Tests

Impulse: IIEC 60255-5:2000
IEEE C37.90-2005
Severity Level:
0.5 Joule, 2 kV channel to chassis
0.5 Joule, 500 V channel to channel

Dielectric (HiPot): IEC 60255-5:2000
IEEE C37.90-2005
Severity Level:
2000 Vac channel to chassis for 1 minute
500 Vac channel to channel for 1 minute
### RFI and Interference Tests

#### EMC Immunity

| Electrostatic Discharge Immunity: | IEEE C37.90.3-2001  
| IEC 60525-22-2:2008  
| IEC 61000-4-2:2008  
| Severity Level: 8 kV contact discharge  
| 15 kV air discharge  
| (Filter A applied) |
| Radiated RF Immunity: | IEEE C37.90.2-2004  
| IEC 61000-4-3:2008  
| IEC 60255-22-3:2007  
| Severity Level: 10 V/m |
| Severity Level: 10 V/m at 900 MHz and 1.89 GHz |
| Conducted RF Immunity: | IEC 60525-22-6:2001  
| IEC 61000-4-6:2008  
| Severity Level: 10 Vrms |
| IEC 61000-4-5:2005  
| Severity Level: 1 kV Line to Line, 2 kV Line to Earth  
| (8 ms filter voltage mode, 6 ms filter high-current mode, 4 ms filter low-current mode) |
| IEC 61000-4-4:2011  
| Severity Level: Class A; 4 kV, 5 kHz; 2 kV, 5 kHz on communications ports |
| Magnetic Field Immunity: | IEC 61000-4-8:2009  
| Severity Level: 1000 A/m for 3 seconds, 100 A/m for 1 minute  
| IEC 61000-4-9:2001  
| IEC 61000-4-10:2001  
| Severity Level: 100 A/m |
| Severity Level: 2.5 kV common-mode  
| 1.0 kV differential-mode  
| (Filter A applied)  
| IEEE C37.90.1-2002  
| Severity Level: 2.5 kV Oscillatory  
| 4.0 kV Fast Transient  
| (Filter A applied) |
| Oscillatory Waves Immunity: | IEC 61000-4-12:2006  
| Severity Level: Ring Wave: 2 kV common, 1.0 kV differential  
| Oscillatory: 2.5 kV common, 1.0 kV differential  
| (Filter A applied) |

| Common Mode Disturbance Immunity: | Frequency: 0 to 150 Hz  
| Severity Level: Level 4, Segment 4:  
| 30 Vrms open-circuit, 15 to 150 kHz |
| Emissions: | Radiated and Conducted  
| Severity Level: Class A |
| Severity Level: Class A |